



THINK AUTONOMOUS

Message

from the

Director

Jonathan Beck



August 2023

NCAT Team Update

I would like to extend a welcome to Stephanie Rispa, NCAT Equity & Inclusion Communications Director. Stephanie brings twenty years of experience as a secondary English teacher, coach, and theater director. Her dedication to serving underrepresented groups stems from her work with the Migrant Summer School Program and advising student-led groups, such as GLOW and REPRESENT. She has hit the ground running as our community has continued to grow and operate at a fast pace over the past few months.

Collaborative Partnerships - CASERM

Earlier this spring, NCAT sent students and faculty from Nebraska Indian Community College, North Dakota State College of Science, and Northland Community and Technical College to a field experience in Arizona and Nevada to leverage their skills and to learn about how drones and hyperspectral sensors could be used to support mining operations. The experience was a part of a partnership between NCAT and the Colorado School of Mines', Center to Advance the Science of Exploration to Reclamation in Mining (CASERM). NCAT and CASERM plan to grow these experiences for other students and faculty in the coming years.

Experience STEAM

Experience STEAM built momentum with a 2023 VEX Signature Event held at Mall of America August 4-5. This was the first qualifying event in the world for the VEX 2024 World's Competition. A special thanks to our partners at IACMI for supporting this event and participating in the teacher workshops! Also this summer, students showed off their skills at the 2023 MATE ROV World Championship held in Longmont, CO. The competition is designed around real-world problems and requires students to think outside the box on innovative solutions. In addition, DRONETECH formed new partnerships with Minneapolis Parks and Rec and the Minnesota Aviation Career Education Camps (ACE), creating replicable models to expand opportunities for students to learn about how drone technology is being integrated into applications across diverse industries.

From the Roadways to the Skies

Charting the roadway, our partners with the ISA-TOPE program were in high gear providing camps, workshops, and demonstrations of their semi-autonomous freightliner, allowing teachers and students to explore the future of the roads. Bridging the gap between the automotive and aviation industries, NCAT hosted a series of workgroups and training sessions, leveraging the great work of NEVTEX's project on the development of Electric Vehicle Technician Training Standards to begin addressing the impact Electric Aircraft will create in aviation. E-Aircraft will be a driving force in Advanced Air Mobility. NCAT is working to get ahead of the power curve by leveraging previous NSF investments, such as the NEVTEX project, which have been addressing the disruption created by electric vehicles across the automotive industry.

Center Activities





Searching for Gold with CASERM

The Colorado School of Mines' Center for Advanced Subsurface Earth Resource Models (CASERM) is a research center based out of Colorado. It was formed to enhance the use of geoscience data in the locating of subsurface minerals.

In March, NCAT, joined by Morgan Dorsey from the Nebraska Indian Community College (NICC) and by the North Dakota State College of Science (NDSCS), continued its partnership with CASERM by traveling to Arizona and Nevada to combine their areas of expertise and use UAS to better locate and identify subsurface mineral resources, including precious metals.

The NCAT team and Dorsey assisted in the project by testing out an experimental drone with a hyperspectral camera attached to the bottom.

Instructor Morgan Dorsey explained the specialized camera. "The visible light spectrum is red, green, and blue, right? So then all those colors mesh so that you see different colors because they're different shades and hues. So that's just a couple of bands" explained Dorsey. "But the hyperspectral [camera] will actually take hundreds to thousands of bands, so you can see rock densities."

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Dorsey explained that once minors can see the different rock densities, they can see the amount of gold metal found within the rock, theoretically allowing mining companies to make more informed decisions regarding where to dig. Dorsey said that it was an amazing mission to be a part of.

NCAT Principal Investigator Jonathan Beck was pleased with the outcome of the trip, saying the students and faculty participating learned a great deal from this experiential learning opportunity. The NCAT team is hoping to continue to collaborate with CASERM on future field research.

[Learn More](#)

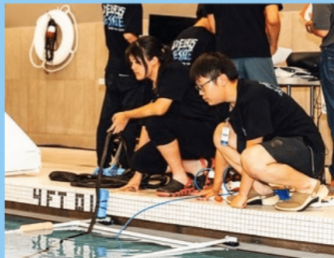


Photography by Morgan Dorsey, MTD Aerial Photography
To learn more about Morgan, see What's My Story?

SUMMER EVENTS

MATE ROV WORLD CHAMPIONSHIPS

In June, competitors gathered in Longmont, CO from all over the world to accept the challenge of designing and building an ROV that can take on global issues.



All three 1st place teams hailed from California.

- Explorer Winner: Jesuit Robotics, Carmichael
- Pioneer Winner: Cabrillo Robotics Club, Aptos
- Ranger Winner: Geneseas, Monterey Bay

Mate II President and Executive Director Jill Zande had this to say regarding the teams, "I continue to be amazed and impressed by the creativity, problem solving, innovation, teamwork, and collaboration that teams display at the event. Each year I come to the closing award ceremonies inspired and encouraged that the future – our future and the future of our big blue Ocean Planet – is in good hands."

[Learn More](#)

MATE FLOATS

August 21-25, MATE II will hold a Marine Technology Summer Camp experience for undergraduate and high school students. The 5-day camp, located at the University of Washington (UW), will introduce students to Global Ocean Biogeochemical float technology. This exciting camp will be taught by UW School of Oceanography Float Engineer Rick Rupan with assistance from UW undergraduate students.

MINNEAPOLIS PARKS AND REC DAY CAMPS

STEAM Outreach Coordinator Aaron Sykes is teaming up with Minneapolis Parks and Recreation this summer to provide UAS day camps in order to introduce kids to UAS and to help them explore the careers in technical areas. The campers are learning about the history of flight, how flight is achieved, and how to legally and responsibly fly drones.




Camper Croix Koski assists STEM Outreach Coordinator Aaron Sykes assemble drone.

ACE Camp


NCAT traveled to Stanton Airport in near Dennison, MN to take part in Minnesota Aviation Career Education (ACE) CAMP by sharing drone history and AT employment opportunities with campers. ACE Camp was founded in 1991 by aviation industry professionals to educate youth about the variety of careers in aviation. At Stanton Airport, ACE campers tried their hand at helicopter flight, flew drones, and rode in a glider plane.

EMPOWER SUMMER CAMP

The ISA-TOPE skid steer was introduced to 14-17-year-old day campers at the Empower Summer Camp in June. This camp reaches out to female participants who are interested in hands-on activities in a variety of fields. According to Carl Borleis, Principal Investigator of the ISA-TOPE Grant, "The ISA-TOPE was used to allow campers to conduct a pre-trip inspection, along with a demonstration of the autonomous technology."




MALL OF AMERICA.



EXPERIENCE **STEAM**
[advanced technological education]

[AUG 1-5, 2023 | MALL OF AMERICA]



2023 VEX Signature Event


First qualifying event in the world to the VEX 2024 Worlds Competition


100 Top-Tier Teams from around the Nation

What Is Experience STEAM

A new STEAM Outreach framework created by NCAT. It places no-cost, hands-on, student-centric STEAM activities in highly public non-traditional spaces. The intent is to facilitate social and economic mobility through access to opportunities inspiring students to consider emerging technology and technician career fields.

VEX Robotics Rocked the Mall!





**Miss Minnesota Teen USA and Her Robotics Team
Joined in on the Fun, Serving
as an Inspiration to Young Ladies
Interested in Robotics.**



New FREE Resources!



Lending Library

We're happy to announce that we have added to the NCAT lending library!!



NewBeeDrones



LEGO Mindstorms EV3

For a full list of lending materials, [click here](#).

Thank you to all who provided feedback on the lending library. We are pleased to share an excerpt from a review from The Kings Academy Drone Team.

"The camp was a great success. The drone portion was entirely kid led. We had about 5 experienced pilots...teaching about 20 campers. All 20 campers from 5th grade to 10th got their FAA TRUST certification, flew four different drones (Q9S, Parrot Mambo, Codrone-Edu, and DJI Mini 2), programmed autonomous code and flew a slightly modified Aerial Drone Competition Mission 2023: Blackout course. Thank you for helping make that possible. The best part was the kids comparing the drones and being able to teach with confidence of varied experience. They had insights, and preferences. I can't tell you what a difference it makes for them to not just talk about how to program in a language, but to be able to express a preference. The campers thought that they were magical programming wizards, and that fed back into the confidence the leaders had... and it was real knowledge they had acquired through their own hands-on experience. Thank you."



What's Your Story?



M o r g a n D o r s e y



MEET MORGAN: UAS ENTREPRENEUR & NEBRASKA INDIAN COMMUNITY COLLEGE INSTRUCTOR

Morgan Dorsey began asking questions about aviation at a young age. "What's that?" "How does it fly?" Knowing their son was not the type to be chained to a desk all day, Dorsey's parents encouraged him to consider aviation as a career possibility, so Dorsey enrolled in the aviation program at the University of Nebraska at Omaha, and the rest is history.

Initially, Dorsey successfully pursued his pilot license, but when the pandemic hit, Dorsey changed his career path to concentrate on unmanned aircraft systems. Without the availability of internships, Dorsey ventured into entrepreneurship, creating his own UAS photography and videography company, MTD Aerial Photography.

"And then how I got in business was I cold-called about 350 people off Google," Dorsey stated. "And I just kind of went down the list, you know, architecture firms, contractors, construction companies...I just started hustling away," said Dorsey. Dorsey's successful venture into aerial photography led to his college professor encouraging Dorsey to become a drone instructor at the Nebraska Indian Community College (NICC).

"The task was to start the drone program for them [NICC]," Dorsey said. "I ended up buying all of our drones, managing grants, developing the curriculum..." In addition, as a senior in college at the time, Dorsey continued taking classes and completed his bachelors degree in aviation.

Dorsey stated that helping to bring a new route to financial security to historically underrepresented groups and "hopefully injecting (money back) into the tribal nations has been a great honor." He hopes to receive another grant in order to continue to develop the drone education program at NICC. Dorsey said that the number of careers centered around drones is rising at a great rate. "I think that we're in the very early stages [of AT]. If you think about anything that you can do, a UAS would probably help you out," he stated.

Through his mentoring program, Dorsey became connected to NCAT, which then led to his collaboration with the the Colorado School of Mines' Center to Advance the Science of Exploration to Reclamation in Mining (CASERM). For more information on the CASERM collaboration, see "Searching for Gold With CASERM".

Videography and Photography by Morgan Dorsey, MTD Aerial Photography

To see more of Dorsey's wonderful photography, [click here](#).

MORE ABOUT MORGAN!

**Tell us about yourself and your background.**

I just graduated from the University of Nebraska at Omaha with a concentration in UAS. I have my private pilot license and I currently teach at Nebraska Indian Community College and started their drone program!

What do you enjoy most about working in the industry you are in?

The people. The aviation community is super tight knit and it is full of great people that love to help and share their experiences.

Share a success story.

Having students pass the part 107 test! It is really satisfying seeing students that I have taught be able to pass a test that I helped them gain knowledge on!

If you are comfortable, share a failure and what you learned from it.

Too many to share haha!

Any tips you would like to share with others in the industry?

Always keep learning. It is impossible to know everything so absorb up everything you can like a sponge.

What excites you most about the future of autonomous technologies?

The possibilities are quite literally limitless. There are so many different industries that use or can use this technology, it is just up to them to develop it!

What would you say to people who are skeptical about autonomous technology?

People were skeptical about the internet too and look how that turned out. Innovation is scary and unknown but that is what makes it exciting!

UAS-CTI School Spotlight



Fullerton College

Fullerton College Assists City Police with Service Drones

FAA-CTI school, Fullerton College, is proud of its drone lab and for good reason. It focuses on a variety of drone applications, including infrastructure inspection, surveying, architecture, photography, and recently, administration of justice and public safety.

To this end, Fullerton College partnered with the Fullerton Police Department and the Flying Lions to initiate a community-wide public safety strategy. The Fullerton Police Department began testing drones as first responders (DRF). According to The Fullerton Observer, drones are placed throughout the city in high positions for immediate response "to reported emergency incidents, calls for service, or first responder requests. In many cases, drones can arrive at any given incident prior to first responders on the ground."



As a school representing FAA-CTI, Fullerton College helps to support the DRF in strictly following all FAA guidelines and privacy laws, regarding UAS.

“This is a great opportunity for Fullerton College students to gain real-world experience. While helping out our local community,” said Jay Seidel, professor and director of the Fullerton Drone Lab at Fullerton College.

Fullerton College provides its students with authentic collaborative experiences such as the partnership with the police department in order to prepare students for tasks that are already assisted by drones and for future uses for them. The college has apprenticeships and internships available. Learn more about Fullerton College by clicking the link below.

3 Core Areas of Focus

Piloting

Manufacturing


Application


Learn More





Upcoming Events





Complete list of upcoming events.

[» View Events](#)





Creating a Standard Curriculum for E-Aircraft Technicians

February

NCAT joined forces with nationwide leaders in the field of electric vehicle technology. The intent is to create a standardized curriculum for all electric vehicle technicians that considers the knowledge, skills, and abilities needed to maintain electric propulsion, distribution, and storage systems across industries.



A group known as NEVTEX was the inspiration for the project as they previously created a curriculum for electric automobile technicians. "What we did is we leveraged that," stated Zackary Nicklin, NCAT Co-PI and Northland UAS Instructor. "We took that [standard] and we stripped everything out of it that was only applicable to electric cars...we came up with an agnostic core, so it doesn't matter what you're working on, if you're looking at high voltage electric propulsion systems, then here's the core right here," Nicklin stated.



June

The group of leaders met again. This time, they took the EV PRO+ Certification. This helped them begin to brainstorm the specific questions they needed to answer regarding the differences between electric aviation, maritime, and ground transportation. "The fact it changes temperature and pressure so quickly, does that affect what a technician needs to know?" questioned Nicklin. "We don't have an answer to that yet. That's what we are trying to figure out."



July

The next step was to meet again to examine the specific aspects that aviation brings to electric vehicle technology in order to answer the questions formed in June. Nicklin stated that it's still in the theoretical stage, which is why they are going slowly and strategically through the process. "Hopefully we have any additional topics necessary to add to the core by the end of the meeting on [July] 24th. From there it would be developing curriculum around it, getting buy-in from industry partners, and then finding other A&P schools that are willing to integrate it."





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